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Medical Education

A Medical Resident in Ponape

ALAN C. NELSEN, MD, *Kailua, Hawaii*

The University of Hawaii has an elective two-month primary care rotation in Ponape, in the Eastern Caroline Islands, for senior medical residents. Many diagnostic and therapeutic situations provide unusual challenges because of the tropical environment and the paucity of medical facilities. Parasitoses, tuberculosis and trauma are common, and certain diseases, such as cholelithiasis and coronary artery disease, have a low incidence, reflecting the socioeconomic conditions. The local intoxicant, sakau, seems to be responsible for dermatologic, pulmonary, and possibly hepatic and neurologic disorders.

The rotation has proved to be a worthwhile educational experience for residents and a benefit to the people of Ponape.

PONAPE is a district in the Eastern Caroline region of the Trust Territory of the Pacific Islands, an American protectorate since the end of World War II. The main island, Ponape, is covered by a 130-square-mile mountainous tropical rain forest. It is located at 7° north latitude, 158° east longitude, approximately 3,200 miles from Honolulu. Other islands in the district include numerous atolls to the east and south, some of which are uninhabited and some with populations ranging up to several hundred people.

As senior medical resident in the University of Hawaii Integrated Medical Residency, I worked in Ponape during a two-month elective rotation. I functioned as the primary physician and consulting internist for this island population of nearly 20,000, and was responsible for the 30-bed medical ward, as well as for inpatient and outpatient consultations.

The author is in private practice in Kailua, Hawaii.

Reprint requests to: Alan C. Nelsen, MD, 1340 Kainui Drive, Kailua, HI 96734.

The practice of medicine in Ponape presents many unique and fascinating aspects. Problems are those common to most underdeveloped areas —for example, deficiencies in sanitation, nutrition, communications and transportation. The situation promises to improve with the planned opening of a $6½ million referral hospital in the main town of Kolonia. Changes will be slow because the population will need time to adjust. New facilities, including a modern laboratory, surgical suite and hemodialysis unit, will be available. However, major training programs for paramedical personnel and improvements in delivery of medications and equipment (including repairs) will be necessary to utilize the hospital properly. The new hospital administrator for the Trust Territory is capable, hard working and realistic in his approach to modernizing health care delivery.

At present there is no real teaching for residents in Ponape except through visiting professors

from Honolulu. Once established, the new hospital will have American-trained specialists, subspecialists, and heads of ancillary and paramedical facilities. The inability of physicians to obtain continuing medical education credits may be overcome if and when satellite communications are established for this purpose. Until then, however, the rotation should be limited to senior residents because of minimal supervision. Also, two months clearly is a minimum period to fully appreciate and learn from the experience; this length of service should be maintained. This may also permit residents to upgrade care in peripheral clinics previously deprived of visits by a physician.

Medications are limited in number and supply. Equipment is often in disrepair, awaiting parts for many months. Before leaving Ponape, I submitted a list of medications and less expensive instruments I believed would be useful. A major problem is correcting shortages before they become critical.

The Patient Population

The population of Ponape is heterogeneous. In addition to those native to Ponape, a large number of Micronesians from atolls, islands and other districts live there—each group with its own culture, attitudes and even particular tendencies to certain illnesses. Dealing with the patient population requires a basic knowledge of the language, which I was able to acquire without much difficulty. Although most people converse in Ponapean (there are no dialects, only varied accents), and some speak English, a fair number know only their own outer-island speech. Occasionally, no one at the entire hospital will speak the language of a particular patient, which may be Mortlockese, Pinglapese, Nukuoran, Trukese, Palauan or another rare native tongue. Translation is often laborious, particularly so because patients tend to be taciturn about their problems. "Eye talk" is often a replacement for the spoken word, and even subtle facial expressions may have an important meaning. Common, high, royal or high royal vocabulary is used, depending on whom one is addressing. Understanding the language and culture is difficult for an outsider, but it is appreciated by patients and helps to gain their confidence.

Taking a history is always tedious and absolutely no questions must be omitted, even the most obvious, because patients will not volunteer information even when asked about a closely-related symptom. Few medical records have been kept, old charts are not much help and Ponapeans generally know little about their medical history. Certainly, drug names are inconsequential to them. Efforts to teach patients about their ills, proper instructions on the importance of adequate treatment and follow-up, and especially education about prevention often seem to fall on deaf ears but must be continued. I gave some instruction on basic problem-oriented charts, and health personnel need to have record keeping stressed.

Many recommendations or treatments we take for granted in Hawaii are difficult in Ponape. The people generally have no means of refrigerating medicines. Their diet is quite limited, making further restrictions unreasonable or impossible. Diabetes mellitus, therefore, is particularly hard to manage. Even such time-established public health measures as boiling all drinking water are difficult for many people.

Discharging a patient is an event worthy of much thought. Almost without exception the usual custom elsewhere of asking a patient if he or she would like to go home is met with a quizzical or amused look. Discharge is exclusively the physician's decision. The tendency to "follow up problems as an outpatient" is not always easy. A patient who does not feel completely well before discharge may seek local cures, or he may live far from town—even on an atoll 500 miles away—making returns to the clinic difficult. The few roads are paved with coral, and are in constant disrepair.

In general, the population is naive about its health, which makes firm direction by an open-minded physician imperative.

Local Medicine

It is a struggle to learn about native medicine, or winni. There are certain people who are known to be healers; they have well-guarded secrets, retaught in a closed system and shared reluctantly. Local dictum states that he who tells all he knows will surely die. Nonetheless, I found that native medicine is of four basic types: massage, spells, lotions and scents, and internally taken preparations.

There is often competition between local and occidental therapy. The two should not be mixed, despite patient requests, or confusion will reign. Some home remedies may indeed be effective, but no studies have been done to determine which are valid. A patient may be ill or he may

be "Ponape sick," against which malady Western medicine may not be effective.

The secrecy and lack of objectivity involved are overt and lead to claims of cures without justification. Research into these areas might prove worthwhile.

Daily Routine

The present hospital facility in Kolonia, Ponape, is old and in disrepair. It consists of an outpatient building, gynecological-surgical, obstetrical-pediatric and medical wards. The latter includes 28 beds which are easily kept full. The outpatient load is variable; I saw about 10 to 12 clinic patients a day at the end of my rotation. These were either discharge follow-ups or referrals from Medex (physicians' assistants), from the Fiji-trained medical officers, or from other towns or islands. Americans who fell ill, or tourists, were generally referred to me or came directly.

Facilities were at a minimum. Laboratory work consisted of complete blood counts, analysis of urine, blood glucose studies, cultures and tests of stool specimens for ova and parasites. X-ray equipment was available, and I often did my own fluoroscopy. An electrocardiograph was in working order, and I improvised a Master exercise test for angina pectoris. A proctosigmoidoscope was available, but no cystoscopy or gastroscopy could be done during my rotation.

Late evening or night rounds to check on new admissions or problems, and to make sure orders were being carried out properly, were a necessity. Emergencies often required that the ambulance driver seek out staff members—such as the surgical team or me—at various points in the community because few people had phones. I was on backup call every night and was often called in when difficult problems arose.

While in Ponape, I began a series of visits by boat to distant villages and dispensaries around the island. Some of these had never been visited by a physician. Local health assistants were contacted by radio in advance and were requested to present their problem patients on those occasions. Some of these patients required transfer back to the district hospital for further workup. Therefore, the hospital in Kolonia, although primitive, served as a referral center. This was also the case when patients were transferred from other islands.

Seriously ill patients could not always be sent to Guam or to Honolulu because of limited funds available for that purpose, and a strict screening procedure was used. I was one of three members on the screening committee. Critical patients who would not survive transfer occasionally required near-heroic measures, at which times the staff generally responded very well. I taught cardiopulmonary resuscitation, and emergency resuscitation was carried out on several occasions when there was hope that a patient could survive without sophisticated life-support systems.

Common Diseases and Etiologic Considerations

Dermatology

The traditional local intoxicant in Ponape is sakau, made from the root of the sakau plant (Piper methysticum). It is similar to kava. In small doses it has a local anesthetic effect on the oropharynx. Higher doses cause a generalized numb feeling, depressed sensorium and decreased psychomotor activity. It may be implicated in dermatologic, pulmonary, gastric and neurological pathology. I have not discerned a tendency toward fatty infiltration or cirrhosis of the liver, although this had been conjectured by others. One 45-year-old Ponapean man who drank sakau heavily for many years was admitted to Ponape District Hospital for control of rapidly progressive guttate psoriasis. In addition to the generalized psoriasiform rash, he had severely dry skin, in places almost parchment-like. Treatment consisted of what was available: coal tar, triamcinolone acetonide cream (Kenalog®), sedation, sun exposure, vitamins and abstinence from sakau. The condition improved over five days and the man was discharged, only to suffer a flare-up requiring transfer to Honolulu for chemotherapy with methotrexate. That this was related to renewed sakau intake is a serious question in my mind.

Missionaries who drink sakau have found that skin dryness decreases if multivitamins are taken, substantiating earlier Japanese reports that there may be a sakau-induced avitaminosis.

Tinea versicolor is epidemic; I would estimate that nearly three quarters of the population are affected. Treatment is infrequently sought. Other skin infections are common: impetigo, molluscum contagiosum (often with secondary bacterial infection) and furunculosis. Cellulitis is common,

related to frequent minor trauma to the lower extremities. Poor hygiene is undoubtedly a factor. Luckily, nearly all Staphylococcus aureus is sensitive to penicillin.

Leprosy is still prominent in Micronesia. Pinglap is long known as an area affected, and previously served as a pilot project for studying the effects of long-term DDS (dapsone) therapy in reducing the incidence of leprosy in a large population.

As in many other areas of the Pacific, a positive Venereal Disease Research Laboratories test is usually indicative of previous yaws when found in an older person, but usually indicates syphilis in a younger person. In Ponape, an increasing number of positive serologies have been noted in prenatal screening being conducted by Dr. Richard Guidotti, Bologna Medical School. Follow-up is being done at present.

Finally, I treated one woman for probable fulminant meningococcemia. She died as her young son had died several months before, which prompted me to recommend treatment of the remaining family members with penicillin.

Pulmonary

Pulmonary disease is one of the more common problems in Ponape. Asthma appears to occur more frequently than in Hawaii, accounting for roughly 5 percent of admissions. In outpatients, asthma often is not responsive to the limited medications available. Many people feel that sakau drinkers have a high incidence of asthma, but the causes for transient small airway obstruction appear to be multiple. During the dry season, coral dust seems to play a role in bronchospasm, as well as inducing a vasomotor rhinitis. An allergic component may be significant (for example, coral dust and fungus), but the frequent coexistence of intestinal parasitosis makes eosinophilia hard to interpret. This also causes speculation as to a pathogenetic role of parasitic larval migration through the lung inducing bronchospasm (Loeffler syndrome). Severe gastritis-duodenitis from heavy helminthic infestation triggering an asthmatic attack is a common clinical finding.

Tuberculosis is still endemic in Ponape. The reported incidence has been about four new cases per month, but this is certainly a conservative estimate. For half of my rotation, no purified protein derivative (PPD) or tuberculosis culture medium was available. I did care for patients with positive PPD tests, patients with pulmonary tuberculosis, presumed or proven vertebral or peripheral tuberculous arthritis. One outpatient had just recovered from tuberculous meningitis, treated by another medical resident. The frequent coexistence of asthma and tuberculosis makes the use of steroids for the former condition hazardous, although sometimes necessary.

Chronic obstructive pulmonary disease, pyogenic lobar pneumonia, posttraumatic empyema (one patient with a gastropleural fistula) are also common. One patient probably had pulmonary embolus, and another was a diabetic with diffuse interstitial pneumonitis (possibly streptococcal) who recovered after a prolonged hospital course.

Cardiovascular

One of the more common cardiac disorders encountered in Ponape is rheumatic heart disease. This accounts for a large number of referrals to Hawaii, both for valve replacement and for endocarditis. I cared for patients with all stages of the disease, from new acute rheumatic fever to end-stage congestive heart failure with ascites secondary to valve disease. Problems are numerous. Rheumatic fever prophylaxis is generally carried out well by the local public health service. However, little consideration is given to endocarditis prophylaxis despite the generally poor dental hygiene of the population. Three patients had suspected subacute bacterial endocarditis. One died during therapy, one was transferred back to Honolulu for dialysis—renal failure probably due to endocarditis-induced glomerulonephritis—and the third was discharged well. Patients with prosthetic valves cannot be fully anticoagulated because of inadequate laboratory facilities.

Coronary artery disease is not as infrequent as I was led to believe. In two months, there were five acute infarctions and one or two people each week were seen for angina pectoris. One myocardial infarction was in a Caucasian. As Western civilization encroaches upon the islands, coronary atherosclerosis seems to accompany it. Most of these patients were either politicians or agency directors.

A high blood pressure detection program has just been started, and early statistics suggest about a 7 percent to 10 percent incidence among the general population.

Cardiomyopathy may be a diagnosis of exclusion, but with available facilities, I felt three pa-

tients were admitted to hospital with this clinical entity in the two months I was in Ponape.

Infectious Disease

Pathogenic organisms of many kinds seem to flourish in this tropical environment. Gastrointestinal parasites are a major cause of hospital admissions and of outpatient visits. The most common pathogens causing upper gastrointestinal symptoms are ascaris and hookworm, the latter sometimes simulating pancreatitis. Strongyloides stercoralis is not uncommon. Bloody diarrhea with tenesmus is amebic in origin until proven otherwise, and cyst carriers are very common. There seems to be sensitivity to the commonly used amebicides. Viral hepatitis is four times more common than in the United States, but the question of amebic hepatitis often enters into the differential diagnosis. Poor personal hygiene and polluted water around the town of Kolonia affecting local mollusks probably play a role. The children around the hospital had a habit of playing with used needles and syringes. However, we took measures to halt this: special needle disposal procedures, education of hospital employees and education of the general population. The island of Truk has a high incidence (about 10 percent) of children with positive hepatitis B surface antigen (HB_s Ag), but the incidence in Ponape is probably as high.

I also introduced the concept of infectious disease control in the hospital itself, emphasizing frequent hand-washing and employee health standards with periodic PPD tests and stool specimen examinations.

Routine follow-up studies for ova and parasites in stool specimens were begun for discharged, treated patients.

Rheumatologic Disorders

I encountered a surprisingly high incidence of arthritis in Ponape. Septic and crystal-induced arthritides were common. Inflammatory joint disease of various types was encountered: rheumatoid arthritis, ankylosing spondylitis, panciarticular juvenile rheumatoid arthritis and acute rheumatic fever.

Miscellaneous

Although I encountered no cases of poisoning while in Ponape, siguatera intoxication is known there, mostly from larger carnivorous fish, such as barracuda. Also, some types of wild tapioca have caused death or severe gastroenteritis when eaten mistakenly.

Suicide is more common among men; the most common method is by hanging. Drug overdose was not a problem, but fairly liberal outpatient use of narcotics occasionally leads to addiction or abuse.

Diving accidents will be a problem of the future because scuba diving has only recently been introduced in Ponape. One case of the bends was encountered before my arrival. There is a small decompression chamber in Saipan and a larger one in Guam. As both local residents and tourists dive, the incidence of stings from rays, cones and stonefish, as well as the number of shark and barracuda attacks, may increase. Fortunately these are now rare.

Without a good study, Ponapean medical officers feel there is a very high incidence of thyroid nodules in Ponape. Two patients with solitary nodules with normal thyroid functions are now awaiting elective resection. Infertility is a serious problem, although infrequent. It carries a great social stigma. Clomiphene citrate may soon be in use.

Although trauma was more the concern of the surgical ward, I came in contact with several interesting cases. Violent acts are not uncommon, especially since weekend drinking of alcohol is almost always excessive. Two patients with cranial trauma requiring emergency craniotomy were cared for during my rotation. One had a subdural, the other an acute epidural hematoma. Both patients did well.

Knifings and spear injuries are common. Car and motorcycle accidents are increasing, and will be a major problem when the roads are paved with asphalt over the next few years.

Occupational hazards exist. Night fishermen are sometimes the victims of a curious form of trauma caused by the hemiramphus quoyi, or halfbeak fish. When these fish are attracted by a light at night, they sometimes inflict injury. Two men were skewered in the thigh, and a third suffered a partial pneumothorax from a halfbeak injury to the chest.

There was no dietitian at the hospital. The kitchen employees had no concept of diet therapy or even of calories. Therefore, any special diet had to enumerate specific foods to be given or avoided, and the quantities to be given. The people eat mainly rice, taro, yams, bananas, co-

conut, fish and some chicken. Canned goods are becoming very popular. Beef is fairly expensive. It is tempting to attribute the near absence of cholelithiasis and the traditional low incidence of coronary artery disease at least in part to the diet, which is high in bulk and low in animal protein and fat. I saw only rare instances of primary malnutrition, and those were in children.

A vigorous cancer detection program by Papanicolaou smears shows a very low incidence of cervical carcinoma. There seems to be a fairly high incidence of molar pregnancy and of choriocarcinoma, however. One woman gave birth to a second child with "colloidon skin."

I witnessed a fascinating neurological abnormality in a 60-year-old Ponapean man in whom overt but fully reversible choreoathetosis developed when he was intoxicated with sakau (sakau la). Until my departure, results of neurological studies in this man were normal when he was not "sakau la."

Academic Value of the Rotation

Although at present there is no formal teaching for residents who elect the Ponape medical rotation, the experience itself is invaluable, and it should improve with the opening of the new district hospital. First, much could be learned from even limited research into pathogenetic mechanisms contributing to Ponapean health problems, and this should be encouraged. This type of experience is mutually beneficial to Ponape and to Hawaii and its university housestaff.

Second, a physician-in-training who finds himself or herself without sophisticated laboratory and diagnostic aids must revert to the basic skills of taking histories and doing physical examinations. Management becomes largely a challenge to clinical acumen. These basics need renewed stress in medical education where the thrust of training is directed toward primary care and adequate health care delivery to rural areas.

A medical resident in Ponape has an enormous responsibility. He is the medical authority for thousands of people with complicated socioeconomic and health problems. Innovation, great energy and adaptability, qualities to be cherished in any physician, are required. Consultation is obtained mainly through costly transfer, and cannot be requested without good reason. Varied problems are encountered, especially when obstetrical and gynecological, surgical, and pediatric consultations are taken into account. This kind of responsibility is good for a medical resident who is about to enter private practice.

Finally, this rotation may allow a resident to witness diseases not otherwise seen. Acute rheumatic fever, amebic dysentery, certain forms of tuberculosis, leprosy, diving accidents and vitamin deficiencies are disorders we read about but seldom have occasion to treat.